UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Silver Spring, Maryland 20910

DEC 5 1990

MEMORANDUM FOR: Distribution*

FROM: Joe P. Clem
Chief, Plans and Regulations Division

SUBJECT: Revised Amendments 21 and 16 to the Fishery Management Plans for the Gulf of Alaska Groundfish Fishery and the Bering Sea/Aleutian Islands Groundfish

Attached is a copy of the EA/RIR/IRFA for the subject document prepared by the North Pacific Fishery Management Council, which has been submitted for Secretarial review under the Magnuson Fishery Conservation and Management Act.

If approved, these revised portions of Amendments 21 and 16 would hold operators of individual trawl vessels accountable for their bycatch of halibut and red king crab while participating in specified groundfish fisheries.

Please provide your comments to me, including "no comment", if that is the case, by December 28, 1990. If you have any questions, please call Mark Millikin at (301) 427-2341.

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COMMENTS:

ENVIRONMENTAL ASSESSMENT/REGULATORY IMPACT REVIEWS/ INITIAL REGULATORY FLEXIBILITY ANALYSIS (EA/RIR/IRFA) FOR REVISED AMENDMENT 21 TO THE FISHERY MANAGEMENT PLAN FOR GROUNDFISH OF THE GULF OF ALASKA AND REVISED AMENDMENT 16 TO THE FISHERY MANAGEMENT PLAN FOR GROUNDFISH OF THE BERING SEA/ALEUTIAN ISLANDS

Prepared by staff of the National Marine Fisheries Service

November 26, 1990

EA/RIR/IRFA FOR REVISIONS TO AMENDMENTS 16 AND 21 TO THE GROUNDFISH FISHERY MANAGEMENT PLANS FOR THE BERING SEA/ALEUTIAN ISLANDS AND THE GULF OF ALASKA

1.0 INTRODUCTION

Revisions to Amendments 21/16 are being considered because a critical component of the bycatch management measures contained in the amendments was disapproved by the Secretary.

1.1 Overview of the Need for Action and the Alternatives

Because trawl, hook and line, and pot fisheries use non-selective harvesting techniques, incidental catches (bycatch) including crab, halibut, and herring are taken in addition to targeted species. A conflict occurs when bycatch measurably impacts the resources available to another fishery. Bycatch management attempts to balance the effects of various fisheries on each other. This is particularly contentious because fishermen value the use of crab, halibut, or herring very differently, depending on the fishery they pursue.

Amendment 21/16 was approved by the Council in June 1990, except for the vessel incentive program, it was approved by the Secretary. The Secretary disapproved the measures that held each bottom trawl fishing operation individually accountable for its bycatch of crab and halibut in the BSAI and halibut in the GOA.

The Secretary determined that the vessel incentive program in Amendments 21/16 is inconsistent with the Magnuson Act and the Administrative Procedure Act. The proposed rule required vessels in each fishery to maintain a 4-week average bycatch rate less than two times the concurrent fleet average in each of the fisheries and for each of three bycatch species. Failure of a vessel to meet such bycatch standards would result in a suspension of the vessel from the Alaskan groundfish fishery for a period ranging from five days to six weeks.

Subsequent to Council approval of the incentive program, NMFS analysis of the 1990 observer database indicated that substantial revisions to the observer database occur after observers are debriefed and their data are analyzed and corrected. Corrected data for a fishery may not be available for up to six months after a fishing week. Because enforcement of the incentive program could only be based upon corrected data, inseason action against vessels that fail to meet acceptable bycatch standards cannot be taken.

The incentive program also failed to conform to requirements of other applicable law, including the Administrative Procedure Act. This Act requires that regulations be reasonable and effective. The observer data are insufficient to determine whether variability of bycatch rates permit the use of four-week fleet averages as a basis for legally acceptable standards.

Although NOAA cannot promulgate regulations to implement this incentive program, it believes an incentive program is a feasible and critical element of the 1991 bycatch management regime. Such a program is the topic of this amendment revision package.

The Council may submit a revised amendment accompanied by proposed regulations to the Secretary. After the Secretary receives the revised amendment, he must approve, partially disapprove, or disapprove the amendment within 60 days. Implementing regulations also must be promulgated within this time frame. A revised incentive program could be implemented in early February, 1991.

The two alternatives being considered are:

1. The status quo (no action).

2. A vessel incentive program that provides civil penalties as sanctions for vessels that exceed published bycatch rate standards for halibut in the BSAI and GOA Pacific cod trawl fisheries and the GOA rockfish trawl fishery or for red king crab in the BSAI rock sole and yellowfin sole/other flatfish fisheries. The halibut program will be extended to the BSAI rock sole and yellowfin sole/other flatfish fisheries if sufficient resources are available without detracting from the effectiveness of the program for other fisheries.

The alternatives are more fully described in Section 3.

2.0 NATURE AND SOURCE OF THE PROBLEM

The groundfish fishery results in incidental fishing mortality for crab, halibut, herring and other prohibited species. These resources can also be used as current or future target catch in the crab, halibut, or herring fisheries.

The Council has established prohibited species catch (PSC) limits to control the take of crab, halibut, and herring in the groundfish trawl fisheries in the BSAI and halibut in the GOA. In 1990, the attainment of these limits resulted in closures of trawl fisheries prior to taking their allowable catch. The

failure to harvest fully the available resources represents a real cost to the trawl fishery. This cost was only partially offset by increased catch and benefits for the fixed gear groundfish fisheries.

For each PSC limit, the amount of groundfish that can be harvested is determined by the average bycatch rate of the fishery. It has been argued that a PSC limit provides fishermen an incentive to reduce bycatch rates. This argument fails to recognize that, although it is in the best interest of the fleet as a whole to decrease bycatch rates, it is in the best interest of individual operators to ignore bycatch and harvest groundfish as fast as possible prior to the closure of the fishery.

This results in inequities and unnecessarily high bycatch rates. The latter will cause a given PSC limit to impose a much higher cost on the fishery it closes. An operation that reduces its bycatch rate bears the costs of doing so generally by decreased catch or increased operating costs, but it does not receive benefits proportional to its success in reducing bycatch or to the cost of doing so. Operations that take no actions to control bycatch rates do not bear such costs but may receive a disproportionately large share of the benefit from the actions taken by others to reduce the fishery's average bycatch rate. The problems are that: (1) there are external costs and benefits that provide each operation with incentives to do what is counter to the best interests of the fishery as a whole and (2) the actions of a few operations can impose substantial costs on the rest of the fleet.

The vessel incentive program approved by the Council as part of Amendments 21/16 was intended to provide a partial solution to these problems by reducing the magnitude of the external benefits and costs. The replacement vessel incentive program discussed below is intended to do the same. This incentive program is similar to the program that was disapproved in that it is primarily intended to decrease the costs that the PSC limits will impose on the trawl fisheries in 1991 and secondarily intended to provide guidance for future development of a comprehensive, effective, equitable, and efficient long-term bycatch management regime.

3.0 DETAILED DESCRIPTIONS OF THE ALTERNATIVES

The preceding introduction to the revision of Amendments 21/16 presented an overview of the revised alternatives being considered. They are more fully described in this section.

3.1 Alternative 1: Status Quo

If Alternative 1 is chosen, the existing bycatch control

management measures and those that have been or will be approved under Amendments 21/16 and 16a will be in place. These do not include a vessel incentive program. The measures that are expected to be in place include those outlined below.

1. Crab and halibut are prohibited species in the groundfish fisheries and cannot be retained.

2. The aggregate BSAI trawl fishery PSC limits for C. bairdi Tanner crab, red king crab, and Pacific halibut are as follows:

C. bairdi Tanner crab:	1,000,000 crabs in Zone 1 for Zone 1 closure 3,000,000 crabs in Zone 2 for Zone 2 closure
Red king crab:	200,000 crabs in Zone 1 for Zone 1 closure
Halibut:	4,400 mt catch in BSAI for Zones 1 and 2H closure 5,333 mt catch in BSAI for BSAI closure

Figure 1.1 presents bycatch protection zones in relation to statistical areas. Zone 1 consists of statistical areas 511, 512, and 516, and Zone 2H is area 517.

3. Apportionments of PSC limits in the BSAI listed for the above species into bycatch allowances to DAP and JVP trawl fisheries, subject to review and revision by the Secretary of Commerce, after consultation with the Council, are authorized. For the 1991 fishing year, fishery categories are: DAP trawl fisheries for turbot, rock sole, yellowfin sole/other flatfish, and all others combined; and the JVP trawl flatfish fishery. The bycatch in each of these three flatfish fisheries counts against its PSC apportionments and when its apportionment is taken the fishery closes. The bycatch in all other trawl fisheries counts against the other fishery PSC apportionments; however, when one of its apportionments is taken, only the bottom trawl Pacific cod and pollock fisheries are closed.

4. In the GOA, the PSC limit for halibut can be set annually and apportioned by season and among the trawl, hook-and-line, and pot gear types.

5. Fishing gear restrictions in both the BSAI and GOA include a new definition of a pelagic trawl and requirements for biodegradable panels and halibut exclusion devises on groundfish pots.

6. For the BSAI, the Regional Director will be able to set a limit on the amount of the pollock TACs that can be taken in other than the mid-water pollock fisheries (16a).

7. For the BSAI, the Regional Director will have the authority to temporarily close limited areas in-season due to high bycatch rates (16a).

8. With the exception of the rock sole and arrowtooth flounder fisheries, the 1991 BSAI flatfish and Greenland turbot fisheries will not open until May 1.

3.2 Alternative 2: Revised Vessel Incentive Program

The following outlines the elements of a revised bycatch incentive program for implementation in 1991 which has been proposed to correct the deficiencies of the vessel incentive "penalty box" provisions proposed under Amendments 21/16 to the groundfish FMPs. Under the revised program, penalties would be imposed after observers have been fully debriefed and their data analyzed and corrected. In most cases, this would result in post-season action against vessels that have exhibited bycatch rates in excess of established bycatch rate standards.

If the Council adopts a revised bycatch incentive program, the program would be subject to public review and comment as part of the Secretarial review process.

I. Scope of 1991 incentive program.

A. Option 1 (as recommended by the Bycatch Committee):

The 1991 incentive program would encompass:

(1) halibut bycatch in the BSAI and GOA Pacific cod trawl fisheries and the GOA "bottom rockfish" trawl fishery; and

(2) red king crab bycatch in the BSAI flatfish fisheries.

(3) All catcher/processor vessels and catcher vessels (including those that deliver unsorted codends to mothership processors) that participate in these fisheries and for which observer data are collected would be participants in the incentive program.

B. Option 2. The incentive program will be expanded to include halibut bycatch in the BSAI flatfish fisheries

if there are sufficient resources to do this without detracting from the program included under Option 1.

II. Fishery Definitions.

A. Each week a bottom trawl vessel's observed BSAI groundfish catch of the TAC species would be used to place it into one of five fisheries for that week. The first of the five rules that is met determines the fishery assignment of a vessel.

1. Greenland turbot fishery if Greenland turbot is at least 35% of its groundfish catch.

2. Pacific cod fishery if Pacific cod is at least 45% of its groundfish catch.

3. Rock sole fishery if rock sole is at least 40% of its groundfish catch.

4. Yellowfin sole/other flatfish fishery if yellowfin sole/other flatfish is at least 40% of its groundfish catch.

5. Other bottom trawl fishery if pollock is less than 95% of its groundfish catch.

The distinction between the rock sole and yellowfin sole/other flatfish fisheries would be used for monitoring the PSC limit apportionments between these fisheries. However, for the purposes of the vessel incentive program, they would both be part of the flatfish fishery. Similarly, the definition of the turbot fishery will be used to monitor the apportionments of PSC limits to the turbot fishery. Neither the turbot fishery nor the other bottom trawl fishery will be included in the vessel incentive program for the BSAI.

B. Each week a bottom trawl vessel's observed GOA groundfish catch of the TAC species excluding arrowtooth flounder will be used to place it into one of three fisheries for that week. The first of the three rules that is met determines the fishery assignment of a vessel.

1. Pacific cod fishery if Pacific cod is at least 45% of its groundfish catch.

2. Rockfish fishery if rockfish (slope rockfish, demersal shelf rockfish, and thornyhead rockfish,

in the aggregate) is at least 30% of its groundfish catch.

3. Other bottom trawl fishery if pollock is less than 95% of its groundfish catch.

The other bottom trawl fishery will not be included in the vessel incentive program for the GOA.

III. Bycatch Standards.

A. Red king crab and halibut bycatch performance standards for vessels in the monitored fisheries will be based on seasonal fixed rates. The red king crab bycatch rate standard will be for Zone 1 and compliance with the standards will be for flatfish fisheries in Zone 1. The halibut standards will be for the BSAI or GOA as a whole and compliance with the halibut standards will be for the BSAI or GOA as a whole. Prior to January 1 and July 1 of each year, bycatch rate standards will be published in the Federal Register that would be in effect for specified seasons within the six-month periods of January 1 - June 30 and July 1 through December 31, respectively. Such rates would remain in effect until revised by a subsequent notice in the Federal Register. Revisions to bycatch rate standards may be made as often as appropriate. Seasonal rates will be based on prior seasonal bycatch rates and other relevant criteria.

B. Separate halibut bycatch standards will be established for the BSAI Pacific cod and flatfish fisheries.

C. A single halibut bycatch standard will be established for the GOA Pacific cod and bottom rockfish fisheries that will be weighted in favor of the bottom rockfish fishery.

IV. Fishery Checkpoints and Penalties.

A. At the end of each fishing month, the average observed bycatch rate of red king crab and\or halibut for each vessel assigned to the BSAI flatfish fishery, the BSAI/GOA Pacific cod fisheries or the GOA bottom rockfish fishery during that month will be judged against the fixed seasonal standard established for those fisheries. If the vessel's average bycatch rate for a fishing month exceeded a seasonal standard, a separate violation could be considered for each week during the month that the standard was exceeded. If

the Magnuson Act amendments as passed by the House and Senate are signed by the President, each violation will carry a maximum civil penalty of $100,000, so total civil penalties for a monthly period could total a maximum of $400,000. Possible sanctions in addition to the civil penalties include permit restrictions and vessel seizure.

B. Observer sampling procedures will be standardized, to the extent possible, to remove discretionary sampling procedures by observers. Standardized procedures will be used to determine vessel bycatch rates and fishery assignments.

C. General Counsel, Alaska Region, will have discretion to determine whether to prorate vessel penalties, taking into account a number of factors, including resource or economic damage to the groundfish trawl fishery, relevant participation in voluntary programs designed to reduce prohibited species bycatch, and culpability of the vessel operator/owner.

D. NMFS will institute an enforcement policy to expedite citation and penalty procedures for vessels with the most flagrant apparent violations (excessive bycatch rates) which are identified inseason. Once such a vessel is preliminarily identified through weekly observer reports, the vessel could be placed on a priority list for observer debriefing, citation, and GCAK legal proceedings.

V. Public Release of Vessel Bycatch Rates.

A. Under a proposed regulatory amendment to the observer plan, NMFS will have the authority to publicize observed bycatch rates of individual vessels. If such authority is approved, NMFS will have the option of posting weekly observed bycatch rates that could be used by vessel operators as guidance on whether or not changes in fishing practices are necessary to meet bycatch performance standards. At a minimum, NMFS will continue to release a vessel's observed bycatch rate to the vessel's operator or owner upon request. Whether or not NMFS exercises authority for public release of observed bycatch rates, inseason weekly rates available to the industry will continue to be based on unverified observer data and subject to revision as observers are debriefed and their data are analyzed and corrected.

4.0 Analysis of the Alternatives

4.1 Alternative 1: The Status Quo

The bycatch management regime that will be in place for the 1991 fishing year with Alternative 1 is more flexible than that which has been in effect during 1990. It is expected to make the PSC limits less costly to the groundfish trawl fishery by postponing the yellowfin sole/other flatfish and turbot fisheries in the BSAI, by providing more flexibility in apportioning the PSC limits among fisheries and seasons in the BSAI and GOA, and by providing the Regional Director with inseason authority to close BSAI fisheries or areas with exceptionally high bycatch rates. Had these measures been in effect in 1990, some of the closures that occurred could have been delayed or prevented and the cost imposed on the trawl fishery as a result of the PSC limits could have been substantially reduced.

These measures are expected to reduce the costs the PSC limits will impose on the trawl fishery in 1991; however, potential changes in the 1991 fishery may result in the limits imposing higher costs. These changes include an earlier and more intensive fishery cod fishery and new entrants into the cod fishery if the first period apportionment of the pollock TACs results in an early switch from the pollock fishery to the cod fishery. They could also include a more extensive bottom trawl fishery for pollock due to increases in pollock fillet prices relative to surimi prices. The potential increase in halibut bycatch early in the year as a result of increased bottom trawl effort for Pacific cod and pollock may be offset to some extent by relatively lower halibut bycatch rates early in the year before halibut move into more shallow waters and become more vulnerable to these fisheries.

Although it is not known whether the PSC limits will be more burdensome to the trawl fishery in 1991 than they were in 1990, it is clear that in the absence of a vessel incentive system that decreases both the external costs of high bycatch rates and the external benefits of taking actions to reduce bycatch rates, fishing operations will continue to have an incentive to have bycatch rates that are not in the best interest of the trawl fisheries. Based on projections from the bycatch model that was used to evaluate Amendment 16a, it is estimated that gross trawl fishery revenue and gross revenue net of variable cost will be, respectively, $130 million and $48 million less without the vessel incentive program assumed to be in place for the purposes of the analysis of Amendment 16a. Similar estimates are not available for the Gulf.

Despite the speculative nature of these estimates, the cost imposed on the trawl fishery by the PSC limits in the BSAI and GOA are expected to be substantially greater if there is no

vessel incentive program. A significant part of the higher costs will be due to exceptionally high bycatch rates associated with a relatively small percentage of both the total number of fishing operations and total groundfish catch. For example, the observer data that are available for 67 fishing operations that participated in the 1990 BSAI Pacific cod fishery indicate that the 13 operations with the highest halibut bycatch rates for the year as a whole: (1) accounted for 38.8% of the observed halibut bycatch but only 16.7% of the observed catch in the cod fishery; and (2) increased the fishery's halibut bycatch rate from 1.1% to 1.5% of its groundfish catch. Similar comparisons are made for other fisheries in the following section in which the effects of the revised vessel incentive program are discussed.

4.2 Alternative 2: Revised Vessel Incentive Program

The proposed elements of the revised vessel incentive program are evaluated with respect to whether they are expected to result in a program that is effective and equitable, that can be implemented early in 1991 given the time and resources that are expected to be available, and that provides a cost effective solution to the problems caused by the externalities associated with reductions in bycatch rates.

4.2.1 Scope of the Program

The program will be limited to the BSAI cod and flatfish fisheries and the GOA cod and rockfish fisheries for several reasons. The time and resources necessary to develop and implement similar programs for additional fisheries are not expected to be available. Expanding the program beyond the level that can be affectively supported would result in a more costly but less effective program.

The program that was initially designed for the BSAI was extended to the GOA to prevent the possibility that fishing operations would practice in the Gulf or fish in the Gulf after not being able to meet the bycatch rate standards in the BSAI. Either would result in higher bycatch rates in the Gulf and corresponding decreases in the amount of groundfish that could be harvested in the Gulf prior to PSC limit induced closures. The fisheries and bycatch species to be included are based on priorities established by industry representatives for the BSAI and GOA trawl fisheries. The closures of the BSAI cod and flatfish fisheries in 1990 posed the most significant costs to the trawl fishery as a result of the BSAI PSC limits. In the Gulf, the cod and rockfish fisheries are expected to account for much of the bottom trawl catch and halibut bycatch. Therefore, these fisheries are thought to be the most critical fisheries for an incentive program.

The vessel incentive program will increase some of the inequities

of the current bycatch management regime. For vessels in BSAI cod and flatfish fisheries and the GOA cod and rockfish fisheries, it will increase the disparity in costs between vessels with 100%, 30%, and no observer coverage. It will also increase the inequity associated with the fact that, in the BSAI, all bycatch except that of the flatfish and turbot fisheries counts against the other bottom trawl PSC bycatch allowances, but that only the bottom trawl cod and pollock fisheries are closed when the apportionment is taken. This situation will be less equitable because even though the cod fishery will be subject to the costs of the vessel incentive program and is expected to have lower bycatch rates as a result of the program, it can still be shut down by high bycatch in other fisheries. The limited scope of the program will also introduce new inequities. Specifically, the fisheries that are not included in the program are not provided as much of an opportunity to reduce their bycatch rates.

The decision to include catcher vessels delivering codends to processing vessels in the incentive program and to exclude processing vessels was based on comments by industry representatives for the trawl fisheries. This will require observers on these processing vessels to identify the catcher vessels associated with each codend delivery. The observer program has indicated that this will require a change in observer reporting that can be accomplished at a relatively small cost. This will prevent a disparity in the accountability of bycatch by catcher vessels that deliver to at-sea and shore based processors.

The addition of halibut to the vessel incentive program for the BSAI flatfish fisheries (i.e, Option 2) will assist in delaying a halibut closure that will close Zones 1 and 2H. Such a closure could substantially reduce the benefits to the flatfish fishery gained by the vessel incentive program for red king crab in Zone 1. If halibut is not included in the program, fishing operations that cannot meet the red king crab bycatch rate standard in Zone 1 may elect to fish in Zone 2. This could result in higher halibut bycatch and an earlier closure of Zones 1 and 2H. It is not known if the time and resources necessary to add halibut to the BSAI flatfish fishery vessel incentive program will be available without detracting from the other programs.

4.2.2 Fishery Definitions

The proposed fishery definitions are based on at-sea observer data for the 1990 DAP fisheries in the BSAI and GOA. Catch and bycatch data by vessel and reporting week (i.e., vessel week observations) were sorted on the basis of the percentage of the groundfish catch of TAC species that was accounted for by the species for which a fishery definition was needed. This was done separately for flatfish, Greenland turbot, and Pacific cod in the BSAI and separately for Pacific cod and rockfish (i.e., slope

rockfish, demersal shelf rockfish, and thornyhead rockfish, in the aggregate) in the GOA. For the Gulf, arrowtooth flounder catch was deducted from groundfish catch prior to calculating species composition by vessel week. The data that were sorted to define a fishery for each species or species group excluded vessel week observations for which the species did not account for at least 20% of the groundfish catch. The exception was that for Greenland turbot, only vessel week observations with Greenland turbot accounting for less than 5% of the catch were excluded. An explanation for each of the definitions in terms of the corresponding sorted data is presented below.

BSAI Cod Fishery The halibut bycatch rate was relatively stable for a cod fishery defined in terms of a minimum catch composition rule of 45% to 60% but fell for a rule of 40%. At or above a 45% rule, cod was the dominant species, below the 45% rule it was not. About 78.4% of the cod catch in the sorted data set was accounted for by vessel week observations in which cod was at least 45% of the groundfish catch.

BSAI Flatfish Fishery The halibut bycatch rate increased sharply when flatfish accounted for less than 40% of the catch and red king crab bycatch rates were subject to large fluctuations over a wide range of rules. At or above a 40% rule, flatfish was the dominant species, below the 40% rule it was not. About 89% of the flatfish catch in the sorted data set was accounted for by vessel week observations in which flatfish was at least 40% of the groundfish catch.

BSAI Greenland Turbot Fishery The halibut bycatch rate was relatively unstable for a Greenland turbot fishery defined in terms of a minimum catch composition rule; however, there was a pronounced decrease in the bycatch rate when Greenland turbot accounts for less than 35% of the catch. Above a 35% rule, Greenland turbot was the dominant species; at the 35% rule, it was the dominant species if arrowtooth flounder is ignored; and below the 35% rule, it was not the dominant species. Over 88% of the Greenland Turbot catch in the sorted data set was accounted for by vessel week observations in which Greenland turbot was at least 35% of the groundfish catch.

GOA Cod Fishery The halibut bycatch rate was unstable for a large range of rules. At or above a 45% rule, cod was the dominant species, below the 45% rule it was not. About 90% of the cod catch in the sorted data set was accounted for by vessel week observations in which cod was at least 45% of the groundfish catch.

GOA Rockfish Fishery The halibut bycatch rate was unstable for a large range of rules. At or above a 35% rule, rockfish was the dominant species, below the 35% rule it was not. Almost 97% of the rockfish catch in the sorted data set was accounted for by

vessel week observations in which rockfish was at least 30% of the groundfish catch.

4.2.3 Bycatch Rate Standards

The use of seasonal bycatch rate standards is intended to allow for seasonality in the factors that affect bycatch rates. The seasonal rates will be established semi-annually to reduce the costs of establishing the rates. For purposes of this analysis, seasonal rates based on calendar quarters were examined, although additional data collected from the groundfish fisheries may indicate that seasonal rates based on other than calendar quarters may be more appropriate.

The red king crab standard will be based on historical bycatch rates in Zone 1 and compliance with the standard will be monitored only for Zone 1. There are two primary reasons for this. First, the red king crab PSC limit is only for Zone 1. Second, if a flatfish fishing operation's monthly catch and bycatch from the BSAI as a whole is used to determine its monthly bycatch rate, the operation may be provided with an incentive that will increase the probability of a halibut closure of Zones 1 and 2H without increasing the amount of flatfish that can be harvested in Zone 1. Specifically, a fishing operation could take part of its catch each month in Zone 2 in an attempt to reduce its BSAI king crab bycatch rate. However, to the extent that halibut bycatch rates are higher outside of Zone 1, the halibut PSC limit induced closure of Zones 1 and 2H will occur sooner. The incentive for a fishing operation to do this would of course be greater if halibut is not included in the incentive program for the flatfish fisheries.

Based on comments from industry representatives, the same set of bycatch rate standards were proposed to be used for the GOA Pacific cod and bottom trawl rockfish fisheries to reduce the cost of establishing, administering, and enforcing the standards. The bycatch rates in the rockfish fishery were not expected to be sufficiently greater than those in the cod fishery to prevent standards based on historical halibut bycatch rates for the rockfish fishery from being appropriate for the cod fishery. Initial analyses of 1990 data, however, indicates that bycatch rates in the rockfish and Pacific cod fisheries may differ significantly for some seasons. This difference may require that separate rates be established for the GOA rockfish and Pacific cod fisheries if the additional administrative and enforcement costs can be accommodated by NMFS.

4.2.3.1 Tentative bycatch rate standards

The fishery definitions presented above were used to place each 1990 vessel week observation into one of the vessel incentive program fisheries or into the other fishery category. The data

for each of the incentive program fisheries were sorted by fishery, quarter, halibut (or red king crab) bycatch rate, and vessel month to calculate the distribution of catch and bycatch by quarter for each fishery. The sorted data were then used to select tentative bycatch rate standards and to estimate the effects of those standards on average bycatch rates.

For each fishery and quarter, for which there are sufficient data: (1) the average bycatch rate is stated; (2) the average bycatch rate for the vessel month observations with the lowest bycatch rates but that account for about 80% of the catch is given; (3) the tentative standard is set equal to the latter average bycatch rate; and (4) an estimate of the effect of that standard is presented. In some cases, the small number of observations prevented the identification and use of the bycatch rate associated with the 80% of the catch with the lowest bycatch rates. For the Gulf, halibut bycatch rates are presented as a percentage of groundfish catch excluding arrowtooth flounder.

The estimate of the effect of a standard on the average bycatch rate of a fishery is naturally quite speculative. The estimates presented below were generated by eliminating all vessel month observations with a bycatch rate greater than twice the standard. The implicit assumptions are that no operation will exceed the standard by more than 100% and that those that did in 1990 would have taken actions such that their bycatch performance would have duplicated that of operations that did not exceed the standard by more than 100%.

The 1990 bycatch rate, the tentative standard, and an estimate of the resulting bycatch rate by fishery and quarter are summarized in Table 1.

If it is determined that cod fishery halibut bycatch rates differ substantially between the Western Gulf and Central Gulf, it may be desirable to establish the Gulf cod fishery standard based on the bycatch rate data from the area with the higher rates. Due in part to the flexibility there is in establishing the halibut PSC limit for the GOA trawl fishery and to the distribution of bycatch rates among vessels, a more lenient standard for the GOA cod fishery may not result in a substantially earlier closure of the GOA bottom trawl fishery.

4.2.3.1.1 Halibut bycatch rates

First quarter BSAI cod fishery The data used for the cod fishery consists of all vessel week observations for which cod accounted for at least 45% of a vessel's weekly groundfish catch and for which Greenland turbot accounted for less than 35% of the catch. During the first quarter, the average halibut bycatch rate for the fishery as a whole was 1.35% (i.e., 1.35 mt of halibut per 100 mt of groundfish). However, about 80% of the catch was taken

in the set of vessel month observations that had an average bycatch rate of 0.89%. The other (higher bycatch rate) observations accounted for 20% of the groundfish catch but for almost 48% of the halibut bycatch. If the bycatch rate standard had been 0.89%, it is estimated that the average bycatch rate also would have been 0.89% and about 52% more groundfish catch could have been taken with the same amount of halibut bycatch.

Second quarter BSAI cod fishery During the second quarter, the average halibut bycatch rate for the fishery as a whole was 1.85%. However, about 80% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 1.05%. The other (higher bycatch rate) observations accounted for 20% of the groundfish catch but for 54% of the halibut bycatch. If the bycatch rate standard had been 1.05%, it is estimated that the average bycatch rate would have been 0.96% and about 93% more groundfish catch could have been taken with the same amount of halibut bycatch.

Third and fourth quarters BSAI cod fishery Due to the PSC limit induced closures, there is not sufficient data from the 1990 DAP fishery to establish standard rates or estimate the effects of such standards. Both will be done, to the extent possible, using data from the 1986-89 joint venture fisheries.

First quarter BSAI flatfish fishery The data used for the flatfish fishery consists of all vessel week observations for which flatfish accounted for at least 40% of a vessel's weekly groundfish catch and for which Greenland turbot accounted for less than 35% of the catch and cod accounted for less than 45% of the catch. During the first quarter, the average halibut bycatch rate for the fishery as a whole was 1.31% (i.e., 1.31 mt of halibut per 100 mt of groundfish). However, about 80% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 0.94%. The other (higher bycatch rate) observations accounted for 20% of the groundfish catch but for almost 42% of the halibut bycatch. If the bycatch rate standard had been 0.94%, it is estimated that the average bycatch rate would have been 0.92% and about 42% more groundfish catch could have been taken with the same amount of halibut bycatch.

Second quarter BSAI flatfish fishery Due to the PSC limit induced closures, there is not sufficient data from the 1990 DAP fishery to establish standard rates or estimate the effects of such standards. Both will be done, to the extent possible, using data from the 1986-89 joint venture fisheries.

Third quarter BSAI flatfish fishery During the third quarter, the average halibut bycatch rate for the fishery as a whole was 0.17%. However, about 85% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 0.08%. The other (higher bycatch rate) observations accounted

for 15% of the groundfish catch but for 59% of the halibut bycatch. If the bycatch rate standard had been 0.08%, it is estimated that the average bycatch rate also would have been 0.08% and about 125% more groundfish catch could have been taken with the same amount of halibut bycatch.

The average rate that was achieved during the third quarter was primarily the effect of a voluntary industry program to reduce halibut bycatch rates. Further reductions or even the maintenance of this low rate may be difficult. Therefore, the tentative standard is set at 0.17%.

Fourth quarter BSAI flatfish fishery During the first part of the fourth quarter, the average halibut bycatch rate for the fishery as a whole was 0.19%. However, about 77% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 0.11%. The other (higher bycatch rate) observations accounted for 23% of the groundfish catch but for 54% of the halibut bycatch. If the bycatch rate standard had been 0.11%, it is estimated that the average bycatch rate also would have been 0.11% and about 73% more groundfish catch could have been taken with the same amount of halibut bycatch.

The average rate that was achieved during the first part of the fourth quarter was primarily the effect of a voluntary industry program to reduce halibut bycatch rates. Further reductions or even the maintenance of this low rate may be difficult. Therefore, the tentative standard is set at 0.19%.

First quarter GOA rockfish fishery The data used for the rockfish fishery consists of all vessel week observations for which rockfish accounted for at least 30% of a vessel's weekly groundfish catch excluding arrowtooth flounder and for which Pacific cod accounted for less than 45% of the catch. During the first quarter, the average halibut bycatch rate for the fishery as a whole was 2.91% (i.e., 2.91 mt of halibut per 100 mt of groundfish). However, about 64% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 1.17%. The other (higher bycatch rate) observations accounted for 36% of the groundfish catch but for 74% of the halibut bycatch. If the bycatch rate standard had been 1.17%, it is estimated that the average bycatch rate would have been 1.12% and about 160% more groundfish catch could have been taken with the same amount of halibut bycatch.

Second quarter GOA rockfish fishery During the second quarter, the average halibut bycatch rate for the fishery as a whole was 3.31%. However, about 81% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 1.89%. The other (higher bycatch rate) observations accounted for 19% of the groundfish catch but for 54% of the halibut bycatch. If the bycatch rate standard had been 1.89%, it is

estimated that the average bycatch rate would have been 1.65% and about 100% more groundfish catch could have been taken with the same amount of halibut bycatch.

Third quarter GOA rockfish fishery During the third quarter, the average halibut bycatch rate for the fishery as a whole was 1.96%. However, about 81% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 0.94%. The other (higher bycatch rate) observations accounted for 19% of the groundfish catch but for 64% of the halibut bycatch. If the bycatch rate standard had been 0.94%, it is estimated that the average bycatch rate would have been 0.83% and about 136% more groundfish catch could have been taken with the same amount of halibut bycatch.

Fourth quarter GOA rockfish fishery During the first part of the fourth quarter, the average halibut bycatch rate for the fishery as a whole was 8.49%. About 89% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 0.25%. The other (higher bycatch rate) observations accounted for 11% of the groundfish catch but for 97% of the halibut bycatch. If the bycatch rate standard had been 0.25%, it is estimated that the average bycatch rate would have been 0.01 and a huge amount of groundfish could have been taken with the same amount of halibut bycatch.

First quarter GOA cod fishery The data used for the cod fishery consists of all vessel week observations for which cod accounted for at least 45% of a vessel's weekly groundfish catch excluding arrowtooth flounder. During the first quarter, the average halibut bycatch rate for the fishery as a whole was 3.31% (i.e., 3.31 mt of halibut per 100 mt of groundfish). However, about 80% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 0.52%. The other (higher bycatch rate) observations accounted for 20% of the groundfish catch but for 87% of the halibut bycatch. If the bycatch rate standard had been 0.52%, it is estimated that the average bycatch rate would have been 0.33% and about 900% more groundfish catch could have been taken with the same amount of halibut bycatch.

If the proposed first quarter rockfish standard of 1.17% had been used for the cod fishery in 1990, it is estimated that the average bycatch rate in the cod fishery would have been 0.62% and about 434% more groundfish could have been taken with the same amount of halibut bycatch.

Second quarter GOA cod fishery During the second quarter the average halibut bycatch rate for the fishery as a whole was 3.06%. However, about 81% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 1.18%. The other (higher bycatch rate) observations accounted for 19% of the groundfish catch but for 69% of the halibut

bycatch. If the bycatch rate standard had been 1.18%, it is estimated that the average bycatch rate would have been 0.46% and about 565% more groundfish catch could have been taken with the same amount of halibut bycatch.

If the proposed second quarter rockfish standard of 1.89% had been used for the cod fishery in 1990, it is estimated that the average bycatch rate in the cod fishery would have been 0.99% and about 209% more groundfish could have been taken with the same amount of halibut bycatch.

Third quarter GOA cod fishery During the third quarter the average halibut bycatch rate for the fishery as a whole was 3.29%. However, about 81% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 1.04%. The other (higher bycatch rate) observations accounted for 19% of the groundfish catch but for 74% of the halibut bycatch. If the bycatch rate standard had been 1.04%, it is estimated that the average bycatch rate also would have been 0.42% and about 683% more groundfish catch could have been taken with the same amount of halibut bycatch.

If the proposed third quarter rockfish standard of 0.94% had been used for the cod fishery in 1990, it is estimated that the average bycatch rate in the cod fishery would have been 0.29%, and groundfish catch could have increased by a factor of 10 without increasing the amount of halibut that was taken.

Fourth quarter GOA cod fishery During the first part of the fourth quarter, the average halibut bycatch rate for the fishery as a whole was 5.15%. However, about 87% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 1.24%. The other (higher bycatch rate) observations accounted for 13% of the groundfish catch but for 79% of the halibut bycatch. If the bycatch rate standard had been 1.24%, it is estimated that the average bycatch rate would have been 0.48% and groundfish catch could have increased by a factor of almost 10 without increasing the amount of halibut that was taken.

If the proposed fourth quarter rockfish standard of 0.25% had been used for the cod fishery in 1990, it is estimated that the average bycatch rate in the cod fishery would have been 0.17%, and groundfish catch could have increased by much more than a factor of 10 without increasing the amount of halibut that was taken.

4.2.3.1.2 Zone 1 red king crab bycatch rates

First quarter BSAI flatfish fishery The data used for the flatfish fishery consists of all vessel week observations for

which flatfish accounted for at least 40% of a vessel's weekly groundfish catch and for which Greenland turbot accounted for less than 35% of the catch and cod accounted for less than 45% of the catch. During the first quarter, the average red king crab bycatch rate for the fishery as a whole was 2.88 (i.e., 2.88 red king crab per mt of groundfish). However, 78% of the catch was taken in the set of vessel month observations that had an average bycatch rate of 1.70. The other (higher bycatch rate) observations accounted for 22% of the groundfish catch but for 54% of the red king crab bycatch. If the bycatch rate standard had been 1.70, it is estimated that the average bycatch rate would have been 0.56 and over 400% more groundfish catch could have been taken with the same amount of red king crab bycatch.

Second through fourth quarters BSAI flatfish fishery Due to the PSC limit induced closures, there is not sufficient data from the 1990 DAP fishery to establish standard rates or estimate the effects of such standards. Both will be done, to the extent possible, using data from the 1986-89 joint venture fisheries.

4.2.4 Fishery Check Points and Penalties

Monthly check points will be used to provide a balance between the benefits and costs of periods of various lengths. Within a month, a fishing operation would have an opportunity either to bank catch with low bycatch rates against the possibility of having high bycatch rates for a short period or to make adjustments if it initially had high bycatch rates. Weekly check points would not provide such opportunities and in fact may provide little opportunity for corrective actions by a fishing operations due in part to the time delay that can occur in providing the fishing operation with observer program estimates of bycatch rates. The objective of the program is to reduce overall bycatch rates by having each fishing operation take corrective actions when its bycatch rates are too high. The objective is not to assure that high bycatch rates never occur for short periods of time.

A longer period between check points would provide a greater opportunity for fishing operations to make the necessary adjustments. However, it would both decrease the perceived urgency of making the appropriate corrections and decrease the potential timeliness of enforcement action against a vessel which has excessive bycatch. The effectiveness of the program is dependent on the potential of a quick and certain response when a fishing operation is imposing large costs on the fishery as a whole.

The range of penalties is sufficiently broad that the penalty for taking excessive bycatch can be comparable to the costs that the excessive bycatch imposes on a specific trawl fishery. If this

is done, the penalties will eliminate the externalities that provide fishing operations an incentive to have bycatch rates that are too high from the perspective of a fishery as a whole. To the extent that this is done, the cost that a specific PSC limit apportionment imposes on a trawl fishery will tend to be minimized.

To do this, the normal vessel penalties could be based on three factors: (1) the extent to which a vessel exceeds a standard bycatch rate during a month; (2) the vessel's total catch of allocated groundfish species for the month; and (3) an estimate of the value of the foregone groundfish catch per unit of excessive bycatch. The estimate of the vessel's total groundfish catch would be based on product weights and discards reported weekly by a catcher/processor or on fish ticket data including discards for catcher vessels. The value of the foregone groundfish catch would be based on the groundfish catch per unit of bycatch at the bycatch rate standard. For example, if the halibut bycatch standard is 1%, if the vessel has a bycatch rate of 1.5%, if the vessel's groundfish catch is 1,000 mt, and if the net value of groundfish catch is $400/mt, the normal penalty would be calculated as follows:

estimated bycatch = 15 mt of halibut (0.015 x 1,000 mt)

acceptable bycatch = 10 mt of halibut (0.01 x 1,000 mt)

excessive bycatch = 5 mt of halibut (15 mt - 10 mt)

foregone value/mt of excess bycatch = $40,000 ($400/mt of groundfish x 100 mt of groundfish/mt of halibut bycatch)

penalty = $200,000 (5 mt of halibut x $40,000/mt of halibut).

In this example, the penalty of $200,000 would be within the range of permissible penalties if the vessel had exceeded the halibut bycatch rate standard in at least two weeks during the month. If the civil penalties were not adequate to cover the costs imposed on the fishery, additional sanctions could be used. These would include permit restrictions or vessel seizure. The range of sanctions is expected to be sufficiently broad that they could be used to eliminate the externalities.

By holding a fishing operation accountable for the cost its excess bycatch imposes on a fishery, a fishing operation with a high bycatch rate before the end of a month and with little expectation of being able to meet the standard for the month, would have an incentive to voluntarily cease fishing. If instead a flat rate fine for exceeding a standard is used, the same fishing operation would have an incentive to continue to fish that month and perhaps with an even higher bycatch rate.

Penalties based on the amount of excess bycatch, as opposed to those based only on whether or not a bycatch rate standard was exceeded, will not only tend to produce a more efficient solution, they will also tend to produce a more equitable one. It will be more equitable in three ways. First, The disparity in treatment of operations just under and just over the standard is substantially reduced. Second, penalties are reduced in direct proportion to the success of an operation in reducing its bycatch. Finally, the operations that impose the greatest costs on a trawl fishery will have the largest penalties.

In implementing an effective vessel incentive program, the industry has two important advantages compared to the Council and NMFS. The regulatory and budgetary constraints are less severe for industry. However, these advantages are offset by the lack of enforcement authority by industry. In recognition of the fact that a successful industry program can assist in both decreasing the cost that PSC limits impose on the trawl fisheries and decreasing the agency costs associated with bycatch management, the Council, NMFS, and GCAK will encourage and support industry programs to reduce bycatch rates. This will be done by providing bycatch rate information for such programs, to the extent possible given the resources that are available. GCAK could also consider, among other factors, any relevant participation in such programs when recommending penalties in response to a violation of seasonal bycatch rate standards. This level of support for voluntary industry programs could make them more attractive to fishing operations. There is not expected to be sufficient time or resources to develop and implement a vessel incentive program that can support more fully the voluntary programs in 1991.

The effectiveness of the program will also be increased by instituting an enforcement policy to expedite citation and penalty procedures for vessels with the most flagrant apparent violations (those that have imposed the greatest cost on a trawl fishery) which are identified inseason. Once such a vessel was preliminarily identified through weekly observer reports, the vessel could be placed on a priority list for observer debriefing, citation, and GCAK legal proceedings. This will increase the expectation by fishing operations that they will indeed be held accountable for the costs they impose on a trawl fishery.

The ability of individual observers to accurately report catch and bycatch is critical to the success of any vessel incentive program. Any such program will place additional burdens on the observer and provide an increased incentive for a fishing operations to have the observers' estimates understate the actual bycatch rates. These problems and the need to protect the ability of the observers to collect accurate data for a variety

of purposes other than bycatch management are recognized and are being considered by the Observer Program.

Although these problems cannot be eliminated, they can be reduced. One method of doing this is to distance an observer from the action that will be taken against a vessel which exceeds a bycatch rate standard. This will be accomplished to some degree by both the use of monthly check points, as opposed to more frequent check points, and the use of delayed civil penalties, as opposed to the immediate sanctions envisioned in the initial vessel incentive program that was disapproved.

5.0 BIOLOGICAL AND PHYSICAL IMPACTS

The expected differential effects of the two alternatives on bycatch, groundfish catch, marine mammals and birds, and the physical environment are discussed below.

5.1 Bycatch

Compared to Alternative 1 (i.e., the status quo), Alternative 2 will tend to decrease bycatch. However, its primary effect is expected to be reduced bycatch rates that will permit more groundfish to be taken by the trawl fisheries before the PSC limits are reached. The reduction in bycatch could occur for one of two reasons. First, the bycatch in the trawl fisheries is constrained by the PSC limits under either alternative; however, with Alternative 1, groundfish catch and bycatch will be greater in the fixed gear fisheries than with Alternative 2. Second, Alternative 2 may reduce bycatch rates sufficiently that groundfish TACs are reached and fisheries are closed before the PSC limits are fully utilized.

The vessel incentive program is expected to increase the differences in bycatch rates between observed and unobserved fishing operations. This will make it more difficult to estimate the bycatch of unobserved operations and, therefore, total bycatch. This will be more of a problem in the GOA than in the BSAI because a much larger percentage of total groundfish catch will be accounted for by vessels in the length categories that have either no observer coverage or only 30% coverage. To date, approximately 54.7 percent of the bottom trawl catch in the BSAI has been observed compared to about 39.6 percent in the GOA. The differences in bycatch rates could certainly be great enough that it would be inappropriate to use unadjusted observed bycatch rates to estimate total bycatch.

The difference in bycatch rates will increase the difficulty and cost of estimating total bycatch. It will not necessarily increase the probability that actual bycatch will be underestimated, that the PSC limits will be exceeded, or that

bycatch will increase.

5.2 Groundfish Catch

Compared to Alternative 1, Alternative 2 is expected to result in increased groundfish catch in the trawl fishery. The flatfish TACs are expected to be more fully utilized with Alternative 2. The Pacific cod TAC will also be more fully utilized with Alternative 2 unless the fixed gear fisheries would increase their cod catch under Alternative 1 enough to fully offset the lower trawl cod catch that would occur with Alternative 1. With either alternative, groundfish catch would be limited by existing TACs; therefore, neither alternative is expected to adversely affect the biological productivity of the groundfish resources in the BSAI or GAO.

5.3 Marine Mammals and Birds

The difference between the alternatives in terms of their effects on marine mammals and sea birds is not expected to be measurable.

5.4 Physical Environment

The increased bottom trawl effort that is expected to occur with Alternative 2 is within the levels of effort that have occurred in recent years and is not expected to affect the physical environment in a way that will have a measurable effect on the biological productivity of the BSAI or GOA ecosystem.

6.0 SOCIOECONOMIC IMPACTS

6.1 Reporting Costs

Existing reporting practices by industry would not need to be augmented to implement Alternative 2.

6.2 Administrative, Enforcement, and Information Costs

Alternative 2 will result in increased agency costs of up to $400,000. Violation of a bycatch rate standard implemented under Alternative 2 would be prosecuted under the Magnuson Act and other applicable law. The Magnuson Act describes prohibited acts, civil penalties, criminal offenses, and civil forfeitures in sections 307-310 (16 USC 1857-1860). A specific schedule of penalties for violation of bycatch rates standards would be developed by NOAA, General Counsel in consultation with NMFS. The penalty schedule would be designed in such a manner that a economic incentive would exist to comply with the bycatch rate standards established under Alternative 2.

6.2.1 NMFS, Office of Enforcement.

Enforcement of bycatch rate standards would occur after observers have been debriefed and their data checked and corrected. Once a vessel's bycatch rate has been preliminarily determined to be in violation of a bycatch rate standard, additional work would be necessary to develop a case history to support prosecution of the vessel's operator/owner. The work load necessary to prosecute 10 to 15 cases per year would require an additional full time enforcement agent at the GS-11 level ($43,000). Due to the remote nature of Alaska fishing communities, travel of enforcement agents to obtain initial interviews of observers, crew, vessel operators/owners, and others necessary for case documentation is estimated at about $1,000 per case. Expenses for observer travel necessary for additional case documentation is estimated at another $1,000 per case. Given a case load of 10 to 15 violations per year, therefore, travel costs necessary to develop supporting evidence could reach $30,000 per year. This value would increase to the extent that NMFS would incur the salary costs of observers during the period they are being interviewed and away from their contracted duties as an observer.

6.2.2 General Counsel, Alaska Region (GCAK).

Under Alternative 2, additional legal work involving prosecution of violations of bycatch rate standards would require one additional staff attorney for GCAK. Assuming the staff attorney would be hired at the GS-13 level, salary and benefits for additional staff are estimated at about $61,000.

6.2.3 Administrative Costs

Under Alternative 2, up to 120 vessels could receive additional monitoring for halibut and/or red king crab bycatch rates. This estimate is based on the number of vessels that participated in the 1990 Pacific cod and flatfish fisheries in the BSAI and the Pacific cod and bottom rockfish fisheries in the GOA. This level of monitoring would require an additional part-time computer systems analyst/programmer (.5 FTE at the GS-13 level) and up to two additional staff for processing of observer reports, verifying information, key punching data, and responding to industry requests for updated information on vessel and fleet bycatch rates. Given that different fisheries are prosecuted at different times of the year, staff needs may be irregularly spaced throughout the year. A portion of the additional positions, therefore, could be filled by short-term reassignments of personnel from other programs or agencies. Full funding of 2.5 additional personnel would cost about $94,000 annually.

6.2.4 Enhancement of the NMFS observer program

The bycatch reduction program proposed under Alternative 2 is dependent on verified observer data. As such, additional

personnel would need to be hired to conduct observer debriefings and other verification of observer data. The augmented program would require 2 to 3 persons to debrief observers in Dutch Harbor, 1 to 2 persons in Kodiak, and 1 person that would cover Southeast Alaska. ADF&G personnel may help out with some of the debriefing process, but NMFS will need to hire 2 to 3 additional persons for timely debriefing of observers and provide funds for appropriate office space at remote sites. The estimated costs of the enhancements of the observer program is $150,000.

6.3 Distribution of Costs and Benefits

Table 1 provides estimates of the reductions in bycatch rates that would result from the implementation of the vessel incentive program of Alternative 2. The estimated reductions in bycatch rates would allow substantial increases in groundfish catch in the trawl fisheries. The resulting increase in first wholesale value of the associated groundfish products could exceed $100 million and the increase in wholesale value net of variable costs could approach $50 million. These estimates are based on the bycatch model that was used to evaluate Amendment 16a and exclude the potential benefits in the GOA.

The benefits to the trawl fishery from increased cod catch will be offset to some extent by decreased cod catch in the fixed gear fisheries and increased competition in cod markets. The benefits to the trawl fishery from increased flatfish catch are not expected to have similar offsets for the fixed gear fishery.

Alternative 2 will impose costs on the trawl fishery. They include the cost of the adjustments necessary to keep bycatch rates below the standards, paying the penalties when such adjustments are not made, or voluntarily not fishing. Having these choices usually will be preferable to not being able to fish because a PSC limit has been reached.

With the exception of the increased agency costs, the differences in the distribution of benefits and cost will be focussed on those directly involved in the groundfish fisheries. The alternatives are not expected to have measurably different effects on consumers.

The net benefits to those who are directly involved in the groundfish fisheries are expected to substantially exceed the agency costs associated with Alternative 2. Alternative 2 will decrease the costs that the PSC limits will impose on the trawl fishery and it will decrease some of the inequities associated with the distribution of those costs among fishing operations. It does this through the use of civil penalties that will reduce the externalities associate with decreasing bycatch rates. This is an administratively cumbersome method of reducing the

externalities. However, a more effective method is not available in a timely manner. Therefore, Alternative 2 is expected to provide a cost effective solution for 1991 and to provide information that can be used in the development of a more comprehensive, effective, equitable, and efficient long-term bycatch management regime.

IMPACT OF THE AMENDMENTS RELATIVE TO THE REGULATORY FLEXIBILITY ACT

The Regulatory Flexibility Act (RFA) requires that impacts of regulatory measures imposed on small entities (i.e., small business, small organizations, and small governmental jurisdictions with limited resources) be examined to determine whether a substantial number of such small entities will be significantly impacted by the measures. Fishing vessels are considered to be small business. A total of 1,500 vessels may fish for groundfish off Alaska in 1991, based on the anticipated number of Federal groundfish permits that will be issued for the 1991 fishing year. While these numbers of vessels are considered substantial, regulatory measures considered under Alternative 2 (the vessel incentive program) would only affect a small proportion of the fleet (150 - 200 trawl vessels).

FINDINGS OF NO SIGNIFICANT IMPACT

For the reasons discussed above, implementation of neither Alternative 1 nor 2 would significantly affect the quality of the human environment, and the preparation of an environmental impact statement on the final action is not required by Section 102(2)(c) of the National Environmental Policy Act or its implementing regulations.

_____ _____

Assistant Administrator for Fisheries Date

Table 1--1990 bycatch rates, the tentative standards, and estimates of the resulting average bycatch rates by fishery and quarter.

Halibut bycatch as a percentage of groundfish catch

Fishery and quarter	1990 bycatch rate	bycatch standard	resulting bycatch rate
BSAI Pacific cod			
Qt 1	1.35	0.89	0.89
Qt 2	1.85	1.05	0.96
Qt 3	no fishery in 1990		
Qt 4	no fishery in 1990		
BSAI flatfish			
Qt 1	1.31	0.94	0.92
Qt 2	no fishery in 1990		
Qt 3	0.17	0.17	0.17
Qt 4	0.19	0.19	0.19
GOA rockfish			
Qt 1	2.91	1.17	1.12
Qt 2	3.31	1.89	1.65
Qt 3	1.96	0.94	0.83
Qt 4	8.49	0.25	0.01
GOA Pacific cod			
(with standard based on cod fishery bycatch rates)			
Qt 1	3.31	0.52	0.33
Qt 2	3.06	1.18	0.46
Qt 3	3.29	1.04	0.42
Qt 4	5.15	1.24	0.48
(with standard based on rockfish fishery bycatch rates)			
Qt 1	3.31	1.17	0.62
Qt 2	3.06	1.89	0.99
Qt 3	3.29	0.94	0.29
Qt 4	5.15	0.25	0.17

Table 1--(continued)

Zone 1 red king crab bycatch rates
(crab/mt of groundfish)

Fishery and quarter	1990 bycatch rate	bycatch standard	resulting bycatch rate
BSAI flatfish			
Qt 1	2.88	1.70	0.56
Qt 2-4	no fishery in Zone 1 in 1990		

Note the following:

1. The estimates of the resulting average bycatch rates were generated by eliminating vessel month observations which exceeded a standard by more than 100%.

2. For the BSAI, bycatch rates are calculated using the sum of the catch of the major groundfish species.

3. For the GOA, bycatch rates are calculated using the sum of the catch of all groundfish species excluding non-allocated species.

4. Observer Program data from the 1986-89 joint venture fisheries will be used, to the extent possible, to estimate bycatch rates, establish standards, and estimate the effects of those standards on average bycatch rates for the fisheries and quarters for which there was no fishing in 1990.

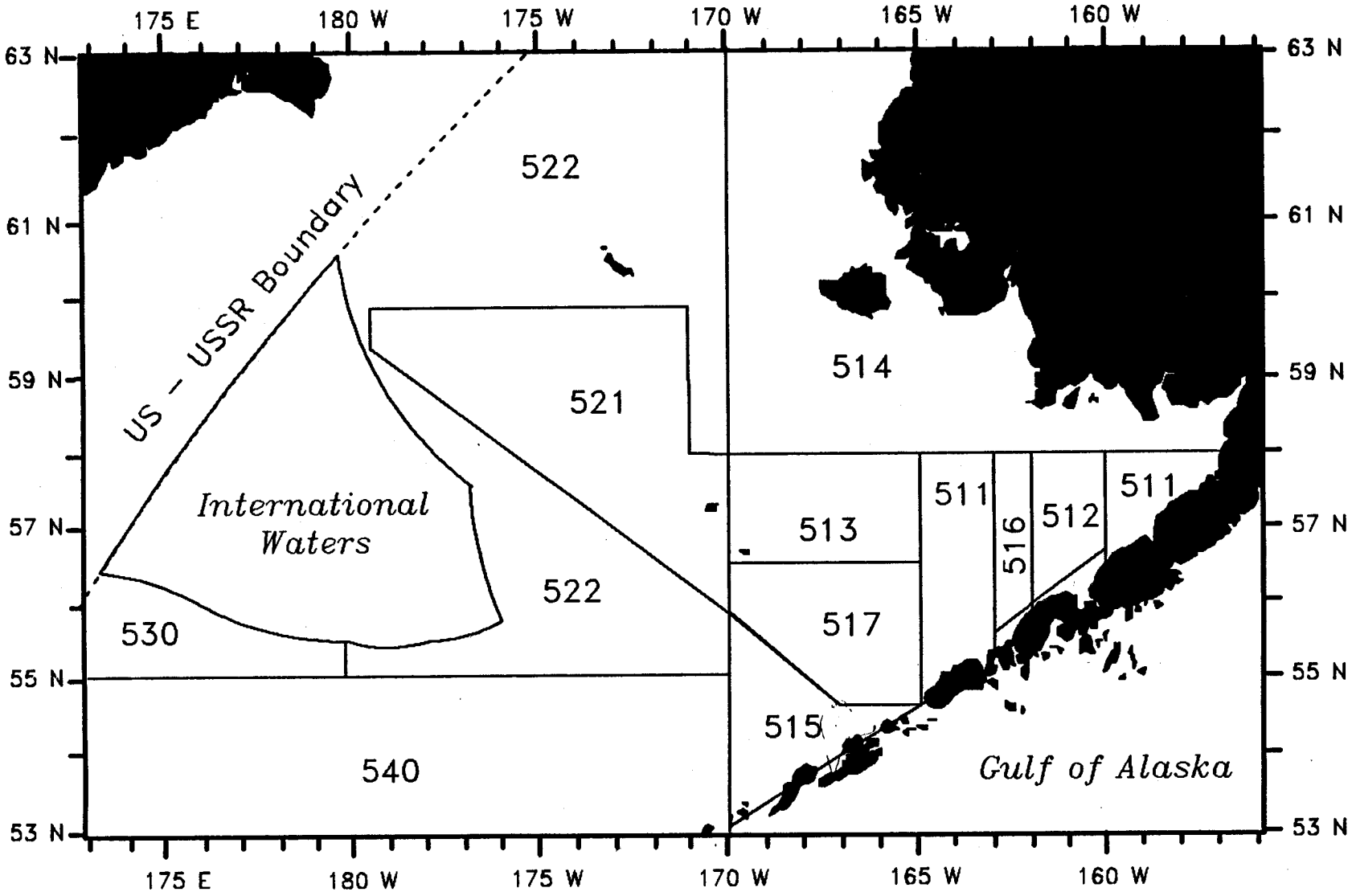

Figure 1.1 Statistical reporting areas in the BS/AI (Amendment 12A)

Bycatch protection zones: Zone 1 = 511 + 512 + 516
Zone 2 = 513 + 517 + 521
Zone 2H = 517

COORDINATION WITH OTHERS

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TEXT TO AMEND THE GROUNDFISH FISHERY MANAGEMENT PLANS

BERING SEA/ALEUTIAN ISLANDS GROUNDFISH FMP

Section 14.4.2.4 Incentive program to reduce bycatch rates of prohibited species.

This new section is added as follows:

> The Secretary of Commerce, after consultation with the Council, may implement by regulation measures that provide incentives to individual vessels to reduce bycatch rates of prohibited species for which PSC limits are established under section 14.4.2.2. The intended effect of such measures are to increase the opportunity to harvest groundfish TACs before established PSC limits are reached.

GULF OF ALASKA GROUNDFISH FMP

Section 4.2.2 Inseason adjustment of time and area, is redesignated as section 4.2.5, And a new section 4.2.4 is added to read as follows:

Section 4.2.4 Incentive programs to reduce bycatch rates of halibut.

> The Secretary of Commerce, after consultation with the Council, may implement by regulation measures that provide incentives to individual vessels to reduce bycatch rates of prohibited species for which PSC limits are established under Section 4.2.3.1. The intended effect of such measures are to increase the opportunity to harvest groundfish TACs before established PSC limits are reached.

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